EPA Region 7 / Region 8 TMDL Review

TMDL ID: IA 06-BSR-0020_1 **State(s):** Iowa, South Dakota
Document Name: Big Sioux River
HUC(s): 10170203, 10230001
Water Body(ies) Big Sioux River
Tributary(ies): BEAVER CREEK, BIG DITCH, BLOOD RUN, BROKEN KETTLE CREEK, BULL RUN, BURR OAK CREEK, CLOVERDALE CREEK, DRY CREEK, DRY RUN CREEK, DUBOIS CREEK, EAST BRULE CREEK, EMERY CREEK, FOUR MILE CREEK, INDIAN CREEK, INWOOD, KANARANZI CREEK, KAPPES CREEK, KLONDIKE CREEK, LITTLE BEAVER CREEK, MUD CREEK, OTTER CREEK, PATEE CREEK, PIPESTONE CREEK, RAT CREEK, ROCK CREEK, ROCK RIVER, SCHULTE CREEK, SIXMILE CREEK, SLIP UP CREEK, SNOW CREEK, SPLIT ROCK CREEK, SPRING CREEK, SPRINGWATER CREEK, TOM CREEK, UNION CREEK, WEST BRULE CREEK, WESTFIELD CREEK, WHITNEY CREEK
Pollutant(s): E. COLI, FECAL COLIFORM

Submittal Date(s): Iowa; 10/16/2007 **Approved:** YES
South Dakota; 12/03/2007

Submittal Letter

State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.

The TMDL document was submitted by the State of Iowa in a letter received by the US Environmental Protection Agency (EPA) Region 7 on October 16, 2007 and by the State of South Dakota by EPA Region 8 on 12/03/2007. The submittal is made to address bacteria impaired reaches in Iowa (E. coli) and South Dakota (fecal coliform). This decision document is identified as pertaining to IA 06-BSR-0020_1 in the header but also includes decisions for the following segments which are included in the TMDL document:

IA 06-BSR-0020_1
IA 06-BSR-0020_2
IA 06-BSR-0020_3
IA 06-BSR-0010_1
IA 06-BSR-0010_2
IA 06-BSR-0010_3
IA 06-BSR-0010_4
SD BS-R-Big_Sioux 13 (Above Brandon to Nine Mile Creek)
SD BS-R-Big_Sioux 14 (Nine Mile Creek to near Fairview)
SD BS-R-Big_Sioux 15 (Near Fairview to near Alchester)
SD BS-R-Big_Sioux 16 (Near Alchester to Indian Creek)
SD BS-R-Big_Sioux 17 (Indian Creek to mouth)

A table is included in the submittal to link each impaired segment to the TMDLs segmentation of the Big Sioux River.

Water Quality Standards Attainment

The water body's loading capacity (LC) for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.

The Big Sioux River's LC is expressed through the use of load duration curves (LDC) for each of the impaired segments. Numeric expressions of the LDC are given in tabular form for each point source and by HUC12 and flow range for LCs. The numeric target used to calculate each LDC is the single sample maximum E. coli concentration (IA) or fecal coliform concentration (SD) of 235 and 400 colony forming units (cfu) per 100 mL respectively. The TMDL identifies required reductions of from 0 - 99.8% depending on segment and percentile of flow exceedance to meet WQS.

The EPA concurs that meeting the TMDL targets will result in the attainment of WQS in the Big Sioux River.

Numeric Target(s)

Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The designated beneficial uses for all segments of the Big Sioux River covered by this TMDL are: in Iowa, Class A, primary contact recreation, and Class B, aquatic life; in South Dakota, Immersion and limited contact recreation, warm water semi-permanent fish life, fish and wildlife propagation, recreation and stock watering, and irrigation watering. The use that is impaired is: for Iowa, Class A primary contact recreation; for South Dakota, immersion recreation.

Iowa's WQS for E. coli are found at:
IAC 61.3(3) Specific water quality criteria.
(1) The Escherichia coli (E. coli) content shall not exceed the levels noted in the Bacteria Criteria Table when the Class "A1," "A2," or "A3" uses can reasonably be expected to occur.

Bacteria Criteria Table (organisms/100 ml of water)

Use	Geometric Mean	Sample Maximum
Class A1		
3/15 – 11/15	126	235
11/16 – 3/14	Does not apply	Does not apply
Class A2 (Only)		
3/15 – 11/15	630	2880
Class A2 and B(CW) or HQ		
Year-Round	630	2880
Class A3		
3/15 - 11/15	126	235
11/16 - 3/14	Does not apply	Does not apply

Class A1 - Primary Contact Recreational Use, Class A2 - Secondary Contact Recreational Use, Class A3 - Children's Recreational Use
When a water body is designated for more than one of the recreational uses, the most stringent

criteria for the appropriate season shall apply.

South Dakota's WQS are
74:51:01:50. Criteria for immersion recreation waters. The criteria of parameters for immersion recreation waters and their allowable variations that are not included under § 74:51:01:55 and Appendix B, unless set under § 74:51:01:24, are as found in the following table:

Parameter	Criteria	Unit of Measure	Special Conditions
Fecal coliform (May 1 – September 30)	≤ 200	/100 mL	geometric mean based on a minimum of 5 samples obtained during separate 24-hour periods for any 30-day period, and they may not exceed this value in more than 20 percent of the samples examined in this same 30-day period
	≤ 400		in any one sample

The impairment is applicable during the Iowa recreation season which begins earlier, March 15, and ends later, November 15, than the South Dakota recreation season. The Iowa season is applicable because as a boundary water the TMDL must be protective of the most stringent WQS.

The TMDL targets numeric criteria (single sample maxima) for both states. For Iowa this is E. coli and for South Dakota, fecal coliform bacteria.

Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.

The submittal uses a direct linkage between the TMDL target and the impairing pollutant. For Iowa the pollutant is E. coli while for South Dakota the pollutant is fecal coliform bacteria. The target concentrations for the TMDL are the single sample maxima for each pollutant as cited in each states WQS, 235 cfu/100mL for E. coli and 400 cfus/100mL for fecal coliform. Where data used for TMDL load and LC evaluation in Iowa was measured in fecal coliform a ratio method was used to determine an equivalent E. coli concentration. The ratio was calculated based on the health effect equivalency between the two parameters, this ratio was calculated as 235/400=0.59.

Iowa uses this ratio to convert their fecal coliform data into E. coli values to determine compliance with their WQS (235 cfu/100mL E. coli). They use their older fecal coliform WQS (400 cfu/100mL) in their ratio to complete the conversion from fecal coliform to E. coli. This demonstrates that the numeric value of Iowa's pathogen standard is roughly equivalent to the numeric value of South Dakota's pathogen standard for the Big Sioux River. However, Iowa's WQS define their recreation season to be from March 15 to November 15 each year, while South Dakota's WQS define their recreation season to be from May 1 to September 30 each year. The longer recreation season for Iowa means that their pathogen standard is the most stringent for this waterbody. The TMDLs were written to achieve the most stringent standards. South Dakota will make adjustments to the NPDES permits that discharge to the Big Sioux River segments identified above to ensure compliance with these TMDLs.

EPA agrees that the targeted pollutant(s) is appropriate for the listed impairment.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.

Sources are subdivided in the TMDL by segment (1-5). Within this subdivision point sources were further divided based on whether they discharged directly into a Big Sioux HUC 12 or into a more distant HUC 12 which drains to the Big Sioux River. Permitted facilities are identified in the submittal and below in this document in the WLA section.

Nonpoint sources were estimated using the Bacterial Indicator Tool (BIT) which takes into account land use, agricultural animal populations, septic systems, and wildlife populations to calculate a load for each HUC 12 covered by the submittal. Appendix B lists the rationale and assumptions used in the BIT model. The land use, animal census, and human population are given for each TMDL segment. Soil types and characteristics are also identified in the submittal in relation to where in the watershed each is located. Wildlife sources are also included in the BIT calculations and are included in the LA for each segment. LDCs are used in the document to depict current loading and the relation of that load to the LC.

EPA determines that all significant sources have been considered.

Allocation - Loading Capacity

Submittal identifies appropriate WLA for point, and load allocations for nonpoint sources. If no point sources are present the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2(i)]. If this is a phase II TMDL the change in LC will be documented in this section.

The LC is expressed by LDCs for each of the five defined segments. Permitted facility's WLAs are listed by state and segment. LAs are listed by HUC12 subbasins by state and segment. Iowa WLAs and LAs are given in E. coli cfu/100mL while South Dakota WLAs and LAs are given as fecal coliform cfu/100mL.

WLA Comment

Submittal lists individual WLAs for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.

WLAs for this TMDL are listed in the table below by state, segment and permit facility. Each WLA is expressed as a daily load of numbers of colony forming bacteria. Iowa facility's WLAs are in E. coli and South Dakota facility's are in fecal coliform bacteria. For facilities discharging to the Big Sioux River the applicable recreational season duration is the most protective. In this case that is the Iowa recreational season which runs from March 15 through November 15.

Iowa Facilities		
Facility Name	**NPDES #**	**WLA**
BSR TMDL segment 1		

Novartis Animal Vaccines	IA0073831	1.12E+09
City of Inwood WWTP	IA0031232	3.11E+09
City of Larchwood WWTP	IA0047333	9.40E+08
West Lyon Comm. School	IA0067199	2.26E+09
Hoogendoom Feedlot	IA0079502	0
BSR TMDL segment 2		
Ysseltein Dairy, Inc-north	IA0077844	0
Ysseltein Dairy, Inc-south	IA0077852	0
Bar K Farms-Inwood	IA0077518	0
BSR TMDL segment 3		
Alvord WWTP	IA0059722	9.67E+09
Ashton WWTP	IA0024457	6.64E+10
Doon WWTP	IA0023736	6.65E+09
George WWTP	IA0036081	6.48E+10
Hull WWTP	IA0020991	9.35E+09
Lester WWTP	IA0026620	1.61E+10
Little Rock WWTP	IA0025356	9.93E+10
Niessink Home WWTP	IA0069370	2.51E+08
Rock Rapids WWTP	IA0032786	1.50E+10
Rock Valley WWTP	IA0033057	7.91E+09
Sibley WWTP	IA0032841	2.16E+11
City of Hawarden WWTP	IA0021083	5.98E+09 (present limits)
Jansma Cattle Co	IA0077640	0
Rock River Feedyards	IA0079022	0
John Fluit, Jr. Feedlot	IA0079685	0
East Valley Farm, Inc.	IA0078107	0
Fairview Feeders	IA0078379	0
Sunrise Feedlots, Inc.	IA0079103	0
Performance Beef	IA0077704	0
Farmer's Coop Society	IA0077577	0
Remmerde Farms	IA0078387	0
Jeff Eitts Feedlot	IA0079189	0
Van Berkel Farms	IA0079464	0
Halverhals Feedlot	IA0079499	0
Rolling Hills Feedlot	IA0079341	0
BSR TMDL segment 4		
Akron WWTP	IA0035211	1.06E+10
Ireton WWTP	IA0027961	3.97E+09
Westfield WWTP	IA0042960	8.39E+08
BSR TMDL segment 5		
none		
South Dakota Facilities		
BSR TMDL segment 1		
City of Brandon	SD0022535	3.88E+10

City of Canton	SD0022489	5.08E+10
BSR TMDL segment 2		
none		
BSR TMDL segment 3		
none		
BSR TMDL segment 4		
none		
BSR TMDL segment 5		
City of Alcester	SD0021695	2.27E+10
Coffee Cup Fuel Stop	SD0027456	2.71E+10

LA Comment

Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in phase I and phase II LAs will be documented in this section.

LAs were assessed based on HU12 sized subbasins. The table below is divided into state, TMDL segment, and HUC12. Iowa LAs are in E. coli and South Dakota's are in fecal coliform bacteria. Loads needed at the Iowa / Minnesota border to protect downstream uses on the Big Sioux River are identified.

Iowa HUC 12s					
BSR TMDL segment 1					
Sub-basin Name	**HUC 12**	**1 % flow**	**10% flow**	**50% flow**	**70% flow**
Big Sioux River		3.14E+10	6.35E+09	2.38E+09	1.59E+09
un-named Creek - Rowena		1.91E+10	3.78E+09	1.45E+09	9.68E+08
Blood Run	101702021303	2.52E+11	5.10E+10	1.91E+10	1.27E+10
Big Sioux River		8.80E+09	1.78E+09	6.68E+08	4.46E+08
Klondike Creek		4.40E+11	8.92E+10	3.34E+10	2.23E+10
Big Sioux River		2.05E+11	4.14E+10	1.55E+10	1.04E+10
Big Sioux River		2.53E+11	5.12E+10	1.92E+10	1.28E+10
Inwood		2.15E+11	4.36E+10	1.63E+10	1.09E+10
BSR TMDL segment 2					
Big Sioux		4.95E+11	1.00E+11	3.76E+10	2.51E+10
BSR TMDL segment 3					
Burr Oak Creek - Rock River		4.64E+11	9.39E+10	3.52E+10	2.35E+10
Unnamed Creek - Dry Run Creek		2.42E+11	4.90E+10	1.84E+10	1.22E+10
Dry Run Creek - Rock River		3.53E+11	7.15E+10	2.68E+10	1.79E+10
Rock River - Burr Oak Creek		4.82E+11	9.77E+10	3.66E+10	2.44E+10
Lower Rock River		3.85E+11	7.80E+10	2.93E+10	1.95E+10
Otter Creek - Rat Creek		5.98E+11	1.21E+11	4.54E+10	3.03E+10

Otter Creek - Schulte Creek		5.69E+11	1.15E+11	4.32E+10	2.88E+10
Cloverdale Creek		2.41E+11	4.88E+10	1.83E+10	1.22E+10
Otter Creek - Kappes Creek		6.39E+11	1.29E+11	4.86E+10	3.24E+10
Rat Creek		3.72E+11	7.54E+10	2.83E+10	1.89E+10
Rock Creek		1.62E+11	3.28E+10	1.23E+10	8.19E+09
Kanaranzi Creek		1.20E+11	2.43E+10	9.10E+09	6.07E+09
Lower Mud Creek		4.38E+11	8.87E+10	3.33E+10	2.22E+10
Upper Mud Creek		1.97E+11	3.99E+10	1.50E+10	9.98E+09
Middle Mud Creek		5.29E+11	1.07E+11	4.02E+10	2.68E+10
Little Rock River		1.10E+10	2.22E+09	8.34E+08	5.56E+08
Little Rock River - Snow Creek		5.32E+11	1.08E+11	4.04E+10	2.69E+10
Emery Creek		2.06E+11	4.17E+10	1.56E+10	1.04E+10
Little Rock River - Whitney Creek		6.17E+11	1.25E+11	4.68E+10	3.12E+10
Tom Creek - Rock River		6.19E+11	1.25E+11	4.70E+10	3.13E+10
Unnamed Creek - Rock River		1.92E+11	3.90E+10	1.46E+10	9.74E+09
Rock River - Tom Creek		6.79E+11	1.37E+11	5.15E+10	3.44E+10
Little Rock River - Emery Creek		4.79E+11	9.71E+10	3.64E+10	2.43E+10
Dry Creek - Big Sioux River		5.98E+11	1.21E+11	4.54E+10	3.03E+10
Upper Sixmile Creek		4.26E+11	8.62E+10	3.23E+10	2.16E+10
Middle Sixmile Creek		3.92E+11	7.94E+10	2.98E+10	1.99E+10
Big Sioux River		9.72E+10	1.97E+10	7.39E+09	4.92E+09
Lower Sixmile Creek		4.64E+11	9.40E+10	3.52E+10	2.35E+10
Big Sioux River		7.79E+10	1.58E+10	5.91E+09	3.94E+09
Big Sioux River		5.69E+10	1.15E+10	4.32E+09	2.88E+09
BSR TMDL segment 4					
Indian Creek - Dubois Creek		5.53E+11	1.12E+11	4.20E+10	2.80E+10
Unnamed Creek - Indian Creek		1.90E+11	3.84E+10	1.44E+10	9.60E+09
Big Sioux River		3.26E+11	6.60E+10	2.47E+10	1.65E+10
Westfield Creek		3.48E+11	7.05E+10	2.65E+10	1.76E+10
BSR TMDL segment 5					
Upper Broken Kettle Creek		4.36E+11	8.83E+10	3.31E+10	2.21E+10
Bull Run		1.96E+11	3.97E+10	1.49E+10	9.93E+09

Lower Broken Kettle Creek		5.44E+11	1.10E+10	4.13E+10	2.75E+10
Big Sioux River		2.73E+11	5.54E+10	2.08E+10	1.38E+10
Big Sioux River		2.33E+11	4.73E+10	1.77E+10	1.18E+10
South Dakota HUC 12s					
Sub-basin Name	**HUC12**	**Flow 0-10%**	**Flow 10-40%**	**Flow 40-70%**	**Flow 70-100%**
BSR TMDL segment 1					
Middle Pipestone Creek	101702031503	8.22E+11	1.05E+11	2.57E+10	1.49E+10
Upper West Pipestone Creek	101702031601	2.33E+12	5.46E+11	1.92E+10	3.53E+09
Lower Pipestone Creek	101702031504	1.33E+12	1.53E+11	8.25E+10	7.49E+10
Lower West Pipestone Creek	101702031602	1.16E+12	1.48E+11	6.42E+10	2.60E+10
Middle Split Rock Creek	101702031402	8.09E+11	1.18E+11	5.76E+10	1.81E+10
Lower Beaver Crk. Split Rock Crk.	101702031702	1.13E+12	2.43E+11	3.51E+10	9.93E+09
Lower Split Rock Creek	101702031403	1.86E+11	2.68E+10	7.82E+09	2.31E+09
Springwater Creek	101702031703	8.51E+09	2.94E+09	6.95E+08	1.50E+08
Four Mile Creek	101702031704	4.65E+11	1.00E+11	1.45E+10	4.10E+09
Blood Run	101702031303	see Iowa LA			
Spring Creek	101702031301	2.68E+11	5.96E+10	1.17E+10	4.08E+09
Big Sioux River - Slip Up Creek	101702031301	1.12E+12	2.48E+11	4.86E+10	1.70E+10
Upper Beaver Creek	101702031901	1.25E+11	3.96E+10	2.92E+10	1.42E+10
Ninemile Creek	101702031305	2.83E+11	7.93E+10	2.05E+10	9.56E+09
Big Sioux River - Klondike Creek	101702031801	2.82E+10	1.03E+10	7.64E+09	2.77E+09
Lower Beaver Creek	101702031902	1.09E+11	4.48E+10	3.31E+10	9.14E+09
Big Sioux River - Peterson Creek	101702031802	6.06E+10	2.22E+10	1.64E+10	5.96E+09
South Fork Beaver Creek	101702031903	6.11E+10	2.24E+10	1.65E+10	6.01E+09
BSR TMDL segment 2					
Big Sioux River - Little Beaver Crk	101702031803	1.05E+12	7.88E+10	3.21E+10	1.64E+10
Big Sioux River - Pattee Creek	101702031804	3.31E+10	2.38E+10	1.61E+10	1.25E+10
Pattee Creek	101702032002	1.07E+11	7.71E+10	5.21E+10	4.05E+10
BSR TMDL segment 3					
Big Sioux River -	101702032001	4.63E+11	2.18E+11	1.48E+11	7.91E+10

Dry Creek					
Big Sioux River - Indian Creek	101702032201	2.38E+11	8.02E+10	4.63E+10	2.08E+10
BSR TMDL segment 4					
Union Creek	101702032202	5.90E+11	1.64E+11	8.51E+10	4.31E+10
Big Sioux River - Union Creek	101702032203	2.51E+11	7.81E+10	3.80E+10	2.14E+10
Big Sioux River - Indian Creek	see entry under segment 3				
Big Sioux River - Rock Creek	101702032205	2.98E+11	9.73E+10	4.48E+10	2.37E+10
BSR TMDL segment 5					
Upper East Brule Creek	101702032401	2.26E+11	7.94E+10	3.32E+10	1.55E+10
West Brule Creek	101702032403	1.88E+11	4.56E+10	2.56E+10	1.45E+10
Lower East Brule Creek	101702032402	2.97E+11	1.23E+11	4.54E+10	1.90E+10
Upper Brule Creek	101702032404	3.47E+11	1.27E+11	5.37E+10	2.93E+10
Lower Brule Creek	101702032405	3.31E+11	1.31E+11	5.65E+10	3.88E+10
Big Ditch	101702032206	3.08E+11	1.13E+11	4.77E+10	2.60E+10
Big Sioux River - Rock Creek	see entry under segment 4				
Mouth of Big Sioux River	101702032207	1.41E+11	4.60E+10	2.11E+10	1.12E+10

Margin of Safety

Submittal describes explicit and/or implicit MOS for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a phase II TMDL any differences in MOS will be documented in this section.

Implicit MOSs apply to each of the five segments in the TMDL document. The first conservative assumption is that each segment will achieve WQS based on load reductions to that segment. Second, no bacterial die-off was calculated for HUC12 subbasins adjacent to the Big Sioux River. Third, dilution effects were not considered for point sources discharging to the Big Sioux River. Fourth, maximum nonpoint source bacteria loads were always available for wash-off in the Bacteria Indicator Tool spreadsheet loading calculations. Fifth, die-off was not modeled in calculating potential bacterial loading from tanks or lagoons.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.

Seasonal variation and critical conditions are addressed in the TMDL by the use of a LDC. This method of assigning LC at all variations in flow, in concert with the application of the WQS recreational season, defines a daily load regardless of season.

Public Participation

Submittal describes required public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

The public comment opportunities for this submittal are subdivided by state. Iowa DNR held three public meetings in June 2005. Two additional stakeholder meetings were also held in June 2005 (see table below). These public and stakeholder meetings included the general public, agricultural producers, and consultants as well as local, county, state, and federal stakeholders. The draft TMDL was also available for public review on the Iowa DNR Web site.

In South Dakota presentations on the progress of the TMDL development were made during monthly meetings of the Lincoln and Union County Conservation Districts. The draft TMDL was also available on the SD DENR Web site.

Table of Iowa meetings

Date	Site	City	County
June 17, 2005	West Lyon Comm. School	Inwood	Lyon
June 21, 2005		Hawarden	Plymouth
June 21, 2005		Sioux Center	Sioux
June 23, 2005	Plymouth County SWCD	Le Mars	Plymouth
June 28, 2005	Lyon County SWCD	Rock Rapids	Lyon
March 9, 2006	Rock Rapids Comm. Center		Lyon
March 9, 2006	Hawarden Comm. Center		Plymouth

Public comments were received from the Iowa Farm Bureau and EPA Regions 7 and 8. These comments and responses from Iowa DNR are included in the administrative record. Comments from the Iowa Farm Bureau and EPA Region 8 and responses to those comments are included in the submittal in Appendix G. Comments from EPA Region 7 were addressed to South Dakota DENR and Iowa DNR after submission and were to clarify conditions in the submittal.

EPA considers the submittal to have had meaningful public review and determines responses made to comments are sufficient.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].

South Dakota DENR will continue monitoring of the Big Sioux main stem at the four historic ambient stations. This monitoring is also used by Iowa DNR for its biannual 305(b) assessments. The submittal acknowledges that additional targeted monitoring will be needed to complete phase II of this TMDL. The present commitment to monitoring is sufficient to monitor the status of the main stem.

Reasonable assurance

Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads.

Reasonable assurances are not required as less stringent WLAs are not made presuming a reduction in nonpoint source loading of indicator bacteria.